Keeping your energy levels up for peak performance is not easy. It doesn't just happen. High energy levels are the result of sound eating and exercise habits. Lack of attention to either can cause performance to suffer. *Keeping Energy Levels Up* is designed to help you plan a diet for a winning performance.

KEEPING ENERGY LEVELS UP

a guide for high school athletes

University of Illinois at Urbana-Champaign
College of Agriculture
Cooperative Extension Service
Circular 1285

One of the most unrecognized nutrition problems of the young athlete is simply not eating enough. Extracurricular activities may make life so hectic that you simply don't take the time to eat. After-school practice sessions may be so exhausting that you feel too tired to eat. But you must take the time to eat the right foods. Don't let fourth-quarter fatigue caused by poor eating hurt your performance.

Another problem of the young athlete is not eating the right kinds of foods—particularly foods high in starch. Many young athletes emphasize foods high in protein instead, and that's a mistake. Eating a balanced diet that has plenty of starch keeps muscle energy up.

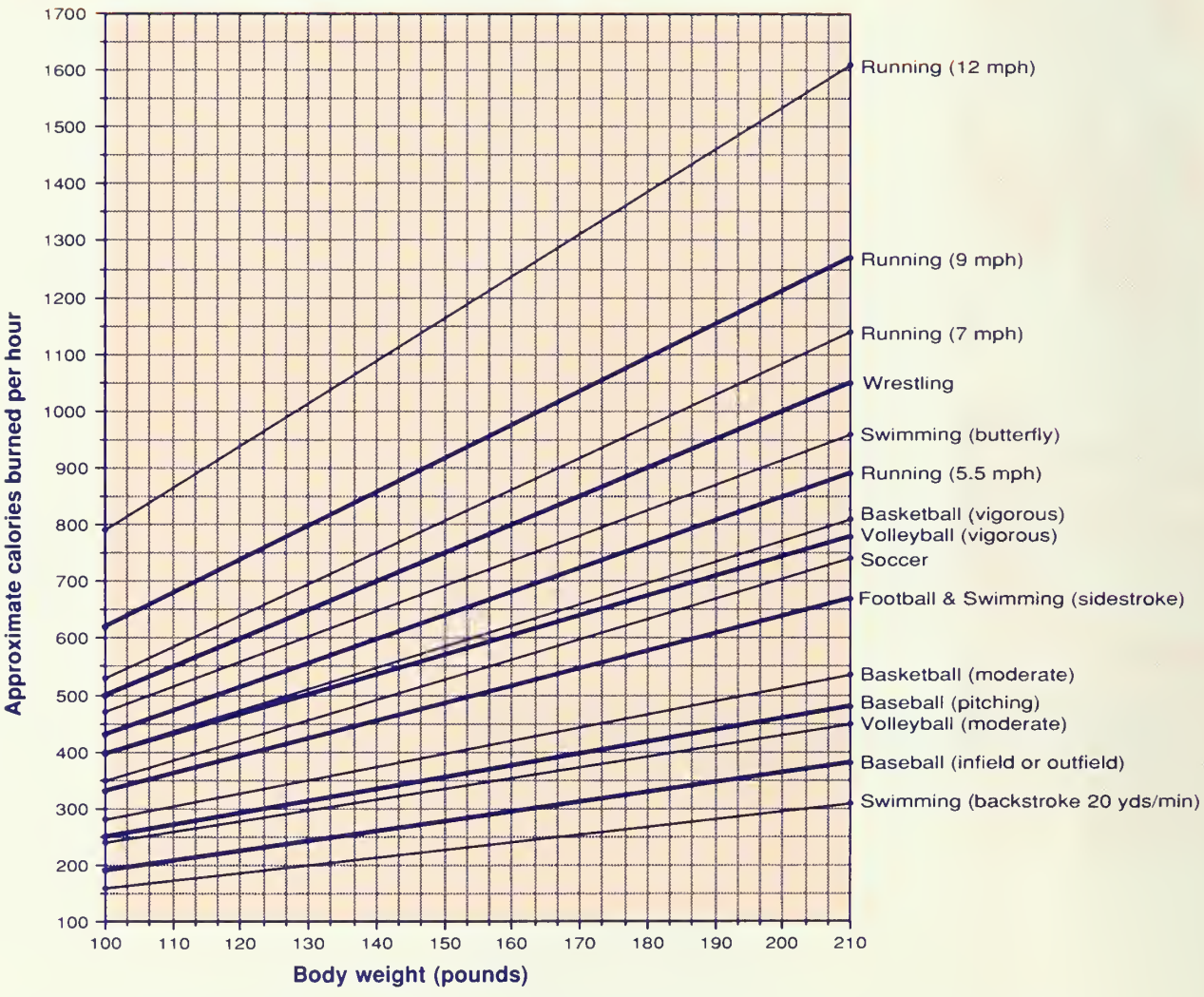
View the videotape *Keeping Energy Levels Up* to see how eating enough of the right kinds of food can build energy levels.

FOOD ENERGY NEEDS INCREASE

Participating in sports can drastically increase your food energy needs. Increased physical activity calls for more food calories. Also, when you train, you increase muscle tissue relative to fat tissue, and muscle tissue requires more calories than fat tissue. Going out for sports can easily increase the daily calorie needs of a boy by 2,000 or more. The daily calorie needs of a girl can increase nearly as much.

The amount of food you need depends on many factors: your age, sex, weight, and activity level. A larger athlete requires more calories than a smaller one because more energy is needed to move more mass over the same distance. The chart below gives estimated energy requirements for various sports. You must remember that more calories are usually burned in a practice session than in actual competition because more total work is usually done during practice. However, the rate at which calories are burned for short periods of time may be greater from short bursts of intense activity during competition.

ESTIMATED ENERGY NEEDS FOR VARIOUS SPORTS



Activity levels vary among sports as well as with the position played in a sport. Obviously, it takes more energy to play basketball than baseball—and more energy to run 1600 meters than the 100-meter dash. To get an estimate of the calories you need for a particular sport, find your body weight on the horizontal axis of the chart, go up to the sport line you are interested in, and then go left on the vertical axis to the calories burned per hour. For example, a 150-pound boy would burn calories at a rate of over 750 calories per hour to train for wrestling. However, due to the intense level of activity during a 9-minute match, he may burn a total of 200 or more calories.

EATING STRATEGIES BEFORE THE GAME

The glycogen stores you have available right before the game are the result of how you've eaten and exercised for the past several days. Once glycogen stores are exhausted, it takes at least two days to fully restore them. Although the pregame meal can stabilize blood sugar levels and provide some energy, *don't look for the pregame meal to provide the bulk of your energy for the game.* For tips on pregame meal selection, see University of Illinois Circular 1275, *The Pregame Meal Planner.*

Glycogen stores in the body are lowered by high levels of exercise and low levels of carbohydrates (particularly starch) in the diet. Glycogen stores in the body are increased by rest or light levels of exercise and high levels of starch in the diet.

You should eat a nutritious, varied diet containing plenty of starchy foods every-day. Give starches particular emphasis the two days just before the event. Also, cut back on workouts a day or two before the big event to increase glycogen stores. Most high school coaches hold lighter workouts the day before a game. This gives glycogen levels a chance to build up.

Here are some tips to help you keep your glycogen reserves up—particularly for the big game.

- Start each day with a good breakfast. Cold cereal, milk, toast, fruit, and/or fruit juice is an easy-to-fix, quick meal that provides plenty of starch.

- Select meals that contain foods from all four food groups. Our bodies use nutrients more efficiently when they are consumed together.

- Use snacks as another opportunity to power up with starch. And don't forget that bedtime snack. Again, cold cereal with milk can serve as a quick snack—even before bedtime. It can be more than the "breakfast" of champions! And you don't have to stop at one bowlful.

- Give starchy foods particular emphasis the days right before the event—build the main meal around a high-starch entree such as spaghetti and meatballs. Make sure the other food groups are also represented.

- Decrease physical activity the day before and the day of the event. Practices directed by your coach are enough. The day before or the day of the event is *not* the time to organize a "pick-up" game with your friends. Rest up!

- Drink plenty of fluids—even at mealtimes—to guard against dehydration.

EMPHASIZE STARCHY FOODS

All young athletes, boys and girls, need to base their diets on a variety of nutritious foods. Each day, as an *absolute minimum,* the teen (nonathlete) should eat:

- 4 servings from the milk group
- 2 servings from the meat group
- 4 servings from the vegetable-fruit group
- 4 servings from the bread-cereal group

Because of their much higher levels of physical activity, many teen athletes should eat two or three times these minimum serving levels—especially from the bread-cereal and the vegetable-fruit groups Athletes need to eat plenty of breads, cereals, and vegetables that are high in starch. A 180-pound tight end could easily eat at least 8 servings and probably more from each of the bread-cereal and vegetable-fruit groups.

Dry beans and peas contain some starch, and they can be used as a meat alternative because they contain ample protein. However, they can cause gas. Do not eat them for a pregame or pre-practice meal unless you tolerate them well. Athletes need plenty of starchy foods because, along with proper training, these foods encourage muscle cells to store glycogen.

Glycogen is a vital energy source for most sports. When muscle cells run out of glycogen, muscle fatigue sets in and performance suffers. Along with a proper exercise program, eating a normal, varied diet from the four food groups with some emphasis on starchy foods will result in enough stored glycogen to carry you through 90 to 120 minutes of vigorous activity. And that is enough for most high school activities.

Unfortunately, many girl athletes think of starchy foods as "fattening." They cut out breads, cereals, and starchy vegetables. The results are predictable: low glycogen, low energy, and poor performance. The girl athlete who wants top performance must eat starchy foods so that she goes into an event with glycogen reserves. Starchy foods are *not* "fattening" in themselves. Eating more food calories than needed of any food puts on pounds. The girl athlete who is training properly need not worry about extra pounds from starchy foods. Given below are examples of foods that contain ample starch.

FOODS HIGH IN STARCH

Pasta

Macaroni
Spaghetti
Noodles
Ravioli

Rice

Breads

Rolls
Muffins
Crackers
Sliced breads
Pancakes

Starchy vegetables

Potatoes
Carrots
Peas
Corn
Winter squash
Sweet potatoes

Beans (dried)

Lima beans
Navy beans
Kidney beans

Peas (dried)

Split peas
Lentils
Blackeye peas

Cereals

Hot cereals like oatmeal
Cold cereals like wheat flakes
(avoid highly sugared cereals)

ENERGY-PACKED MAIN MEALS

Here are some examples of high-starch main meals that will help maintain adequate muscle glycogen. Pick the meals that you like to eat. Or make up your own meal to follow the same pattern. How much you eat depends on many factors: your sex, body size, and amount of physical activity. For example, a large football player may eat at least 2 cups of chicken and noodles (Main Meal #1). On the other hand, a small girl athlete may eat only 1 cup. If generous amounts of the main dishes are eaten, these meals will supply over 1,000 calories, at least 1/3 of the recommended daily allowance (RDA) of most nutrients for teens, and over 50 percent of the energy will be supplied as carbohydrates.

Main Meal #1
Chicken and noodles/gravy
Whole-wheat bread/jelly
Candied sweet potato
Fresh or cooked broccoli
Lowfat milk
Orange juice

Main Meal #2
Frankfurter/bun
Boston baked beans
Pear halves/lettuce
Carrot sticks
Lowfat milk
Grape juice

Main Meal #3
Baked or broiled pork chop
Baked sweet potato
Lettuce and tomato salad/dressing
Whole-wheat bread/jelly
Lowfat milk
Fresh fruit of choice

Main Meal #4
Spaghetti and meatballs/
Parmesan cheese
Italian bread/margarine
Peach halves/lettuce
Lowfat milk
Apple juice

Main Meal #5
Macaroni and cheese
Cooked green beans
Fruit salad
Whole-wheat bread/jelly
Lowfat milk
Orange juice

Main Meal #6
Roast beef/stewed tomato
Baked potato/margarine
Whole-wheat bread/jelly
Fresh fruit of choice
Lowfat milk
Cranberry juice

My Meal

_____
_____
_____
_____
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_____

For tips on planning other main meals, see University of Illinois Circular 1044, *Don't Let Your Diet Let You Down.*

WHAT ABOUT QUICK-ENERGY FOODS?

Young athletes often ask about foods high in fat and sugar, such as candy, pop, and desserts. These foods are often called "empty-calorie" foods because they are usually high in calories but contain few nutrients. Keep consumption of these foods to a minimum. Get your energy from foods that supply ample protein, vitamins and minerals, as well as calories. Many athletes mistakenly believe that high-sugar foods will give them quick energy before a game or an event. *High-sugar foods such as candy or honey should be avoided before a game or event.* Sweets can cause rapid swings in blood sugar, make you feel tired, and decrease performance.

WHAT ABOUT CARBOHYDRATE LOADING?

Should young athletes follow strict carbohydrate loading routines often used by adult athletes who are involved in endurance events such as marathon running or bicycling? *Definitely not!* True carbohydrate loading is a very rigid exercise and diet plan that adult athletes follow for the week right before the big event. During the first half of the week, glycogen stores are drained by exhaustive exercise and by eating a very low-starch diet. The athlete then gets a rebound effect during the second half of the week by eating a very high-starch diet and no exercise at all. Such strict routines drastically increase glycogen reserves that are needed only for marathon-type activities. These very high levels of glycogen are not needed for high school sporting events.

True carbohydrate loading can severely stress the body and cause heart and kidney problems. A high school athlete should eat plenty of starch everyday and not make these drastic dietary swings from low to high levels of starch.

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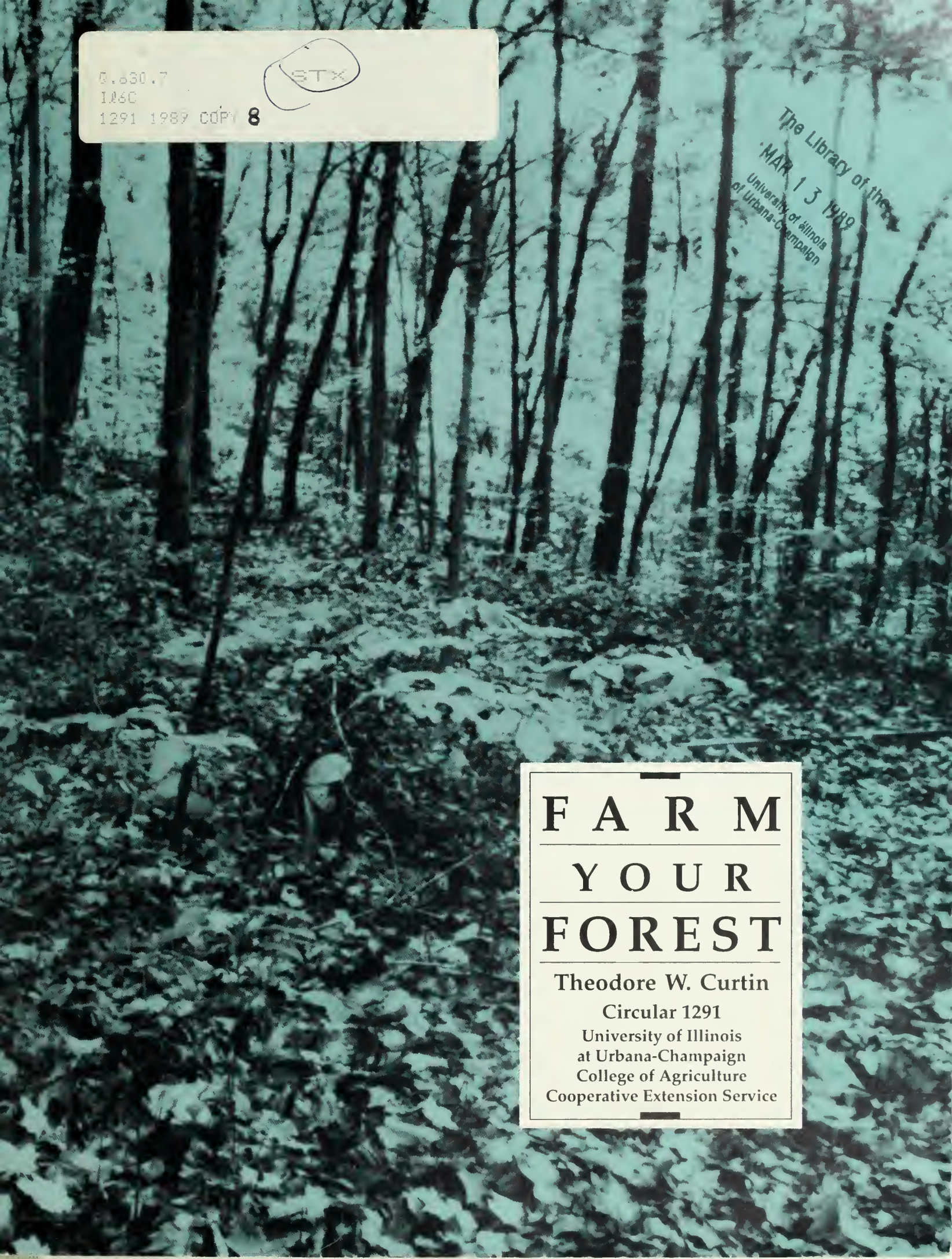

FARM YOUR FOREST

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